*An Account of Observations made with the Eight-Feet Astronomical Circle, at the Observatory of Trinity College, Dublin, since the Beginning of the Year* 1818, *for Investigating the Effects of Parallax and Aberration on the Places of certain fixed Stars; also the Comparison of these with former Observations for determining the Effects of Lunar Nutation. By the Reverend* John Brinkley, *D.D. F.R.S. and M.R.I.A. Andrews Professor of Astronomy in the University of Dublin.* Read June 21, 1821. [*Phil. Trans.* 1821, *p.* 327.]

The observations, of which the details are given in this communication, were instituted with a view to discover the source of the differences that have existed between the observations made at Greenwich and those at Dublin. Dr. Brinkley's former observations of certain stars pointed out a deviation of about one second from the mean place, after having made all usual corrections. Mr. Pond's observations pointed out no such deviations. Dr. Brinkley referred the deviations which he had observed to parallax; and his principal object in the present paper is to ascertain how far that opinion is correct, and to show that no change of figure in the instrument, nor any uncertainties of the changes of refraction, can be admitted as the causes of the effects observed.

As, in deducing the quantity of parallax, the results must be affected by any uncertainty in the constant of aberration; and, in like manner, as in investigating the constant of aberration, from observations of a given star, the parallax, if any, will be involved,—the author adopted the following process in reducing the observations.

The observed zenith distances of a given star were reduced to January 1st, 1819, by the common equations, taking the constant of aberration $= 20''{\cdot}25$. The mean of these was taken. The correct mean zenith distance was supposed equal to this mean $- e$; the constant of aberration $= 20''{\cdot}25 + x$; and the semi-parallax $= p$. The equations of condition thus resulting from the respective observations, thus contained three unknown quantities. These equations were reduced to three by the method of making the sum of the squares of the errors a minimum. The solutions of these three equations give the values of $e$ and $p$, and thence the values of the mean polar distance, constant of aberration, and semi-parallax.

After a very detailed account of the method of conducting his observations, instituted with a view of obtaining an explanation of the source of the difference of the results of his former observations, and of those of Mr. Pond relative to parallax, Dr. Brinkley states his inability to detect any such explanation, or to obtain any result opposed to his former conclusions: he remarks, however, that the discordances between his observations and those made at Greenwich, may by some be considered as showing the great precision of modern observations, since the whole extent of the absolute difference is only about one second. Independent, however, of the interest of the question of parallax, it is important, he observes, to ascertain the origin of this small difference.